DRAFT SUMMARY OF REMOVAL OPTIONS FOR WREN

NRC License area is 110 acres – need map.

Background

There are two types of ponds at the Fansteel site. The first type includes those that were used to store process residues. The second type are those that were and are currently used for wastewater treatment. Ponds 1N and 1S, 2, 3, 4, and 5 were principally used to hold process residues including acidic residues and radioactive isotopes that can be found in the "Work In Progress" (WIP) material. All these ponds (1N, 1S, 2, 3, 4, 5) have been closed and filled in except Pond 3. Pond 3periodically holds surface runoff. Ponds 5, 6, 7, 8, and 9 are wastewater treatment settling ponds and contain principally calcium carbonate and calcium fluoride plus low levels of radioactive isotopes. Ponds 5-9 average 14-53 pCi/g U-238 and 2-26 pCi/g Th-232, according to the 1993 NRC report. Ponds 5-9 also contain metals: aresenic, chromium, mercury, tin, columbium, tantalum, lead and nickel. Ponds 6 through 9 are connected in series. As the calcium fluoride and any other solid settles out, the water is pumped to Ponds 6 and 7 for further clarification where it is eventually released to the Arkansas River through permitted outfall 001. A TCE groundwater plume was detected on the north end of the property in 2006. The TCE groundwater plume appeared to be most concentrated near the Sintering Building with the plume continuing northeastward onto the north portion of the FMRI property. The results reported exceedances of TCE levels for soil, groundwater, and sub-slab vapor samples collected beneath the Sintering Building, Electron Beam Building, and Service Building. To date and with limited sampling, TCE has not been detected in the groundwater interceptor trench sumps.

Areas of concern identified in gamma survey

1) Former Pond 2 open trench

   Former Pond 2 was constructed with a native clay liner. Former Pond 2 was closed containing approximately 12 feet of Work In Progress Material (WIP) and capped by 2-3 feet of soil. WIP includes uranium 238 and thorium 232 and potentially the metals chromium, cobalt, manganese, zinc, mercury, radium 226 and others. According to the 1993 NRC decommissioning plan, the average radioactive isotope concentration in Ponds 2 and 3 is 360-640 pCi/g U-238 and 360-440 pCi/g Th 232. Between 1999 and 2001, a portion of the soil cap was removed and a trench created when Fansteel attempted to excavate the WIP to recover valuable materials. The trench was left open when the recovery activity was abandoned in 2001. The open trench had the highest gamma readings noted during the July, 2019 survey (45X background). Recommend we use a planning task order to evaluate making this location a permanent repository for all on-site radioactive material. Evaluation should include: suitability of this site compared to others on-site; likelihood of inundation and or damage from flooding; potential to use in-situ treatments to reduce isotope mobility (like lime for example); protection of groundwater and surface water and other factors.

2) Sodium Reduction Building – Contains 1000-2000 one ton "supersacks" of soil contaminated with isotopes of uranium and thorium.

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This three-story metal building contains supersacks piled atop one another to the ceiling. The soil in the sacks was removed from the former Pond 1 north and south process ponds in 1994-1995. Fansteel used a qualitative measure to identify and collect these potentially radioactive soils. The way the bags are stacked and the potential condition of the bags will need to be evaluated before a plan to sample or move them can be created. Recommend we use a planning task order to evaluate moving this material to a permanent on-site repository at the most suitable location as determined by the results of the planning task order.

3) Soil Stockpile near Building 4

   This soil was collected from french drains around now closed ponds. The July 2019, gamma survey indicated 27X background gamma radiation. The stockpile is covered above and below with an HDPE liner. Recommend we use a planning task order to determine if this soil is suitable to add to an on-site permanent repository at the most suitable location as determined by the results of the planning task order.

4) Gamma anomalies at Pond 6 levee and outside Sodium Reduction building

   Recommend using planning task order to evaluate source of gamma radiation and develop plan to move radioactive isotopes to on-site repository at the most suitable location as determined by the results of the planning task order.

5) Groundwater and Surface water treatment

   The facility uses a trench and sump treatment system to capture groundwater from an unconfined alluvial aquifer. The system captures approximately 14,000 gallons per day (gpd). The system is designed to treat metals only and treatment is by manual addition of lime to raise pH and drop metals in several settling ponds in series. In addition, the facility is under order from the NRC to treat surface and groundwater prior to discharge under a NPDES permit. This treatment includes partially closed Pond 3 and its associated french drain (15,000 gpd). WIP has been removed from Pond 3. The pond still contains residual radioactive isotopes, chromium, cobalt, manganese, zinc and mercury. Recommend using planning task order to evaluate:
   - Closing and capping Pond 3 to potentially reduce generation of contaminated groundwater
   - Evaluating whether treatment system is capturing chlorinated solvents and if so, is system adequate to treat them
   - Upgrading antiquated manual treatment system